

AIR POLLUTION AND HEMATOTOXICITY – A POPULATION-BASED STUDY IN TAIWAN

Yu-Wen Chiu, *Department of Family Medicine, Ta-Tung Municipal Hospital, Department of Community Medicine, Kaohsiung Medical University Hospital, Taiwan Faculty of Medicine, Kaohsiung Medical University, Taiwan*

Hung-Yi Chuang, *Department of Community Medicine, Kaohsiung Medical University Hospital, Department of Public Health and Environmental Medicine, Kaohsiung Medical University, Taiwan*

Background and Aims: Kaohsiung City is one of the worst air quality cities in Taiwan because of many industries. Sequels of peripheral blood cells influenced by air pollutants exposure have been suggested in literature, yet the association is not clear and the evidence is not sufficient.

Methods: This population-based study recruited subjects from 4 out of 11 districts in Kaohsiung City between the year 2003 and 2004. Demographic data including habitual behaviours as well as blood counts were administered. Real-time measurements and hourly data of environmental pollutants included PM₁₀, SO₂, CO, NO₂, O₃, and PSI were collected from air quality monitoring stations. Air quality reports and blood exam data were merged for statistic analysis. Single-pollutant models and multiple-pollutants models were analyzed to realize the effects of pollutants exposure on white count series..

Results: Ten thousand one hundred and forty subjects (4,378 male) between the ages of 33–87 years were recruited. Carbon monoxide would increase white counts as well as neutrophils (regression coefficients 833.4), monocytes, and lymphocytes; whereas sulfur dioxide would decrease white counts as well as neutrophils and monocytes after short expose (within one week) toward air pollution. Gender, body mass index, and cigarette smoking would also contribute to white count elevation other than air pollution, though their effects are less than air pollutants.

Conclusions: Short exposure (within 7 days) toward air pollutants, carbon monoxide and sulfur dioxide in particular, has been supposed to be closely related with white counts alterations which would mediate to systemic inflammatory status.